Groundwater Flow Model Technical Meeting- AOC Parties Only

April 2021

Meeting Agenda

- Regulatory Agencies Overview
- SSP&A Groundwater Flow Hypothesis Testing Overview
- SSP&A Groundwater Flow Hypothesis Testing Results
- HDOH SME Model Concerns

Commented [TL1]: Open to suggestions on ho convey this

Commented [TL2]: I prefer concerns over revi meetings intent is not to be presenting two diffe reviews of the model.

Commented [GGF3R2]: Fine with me

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Regulatory Agencies Overview

- The Navy submitted models in March 2020 for approval in accordance with the AOC. The report concludes that pumping at RHS can capture particles that originate from beneath the facility and uses this as justification in their TUA and IRR document for capture of potential future releases.
- The Navy's models appear to poorly match 'local' conditions, those most closely located around the facility. This mis-match leads the agencies to consider the current set of models unreliable for estimating the degree of hydraulic containment ("capture") using RHS at this time.
- Additional work is needed to improve the groundwater flow models to address specific issues that will be described by our SMEs. The Agencies believe this work would result in models that better match 'local' site data and more plausibly depict the hydrogeologic setting.
- The recommended improvements would likely lead to models that would better support risk management decisions and ~~would~~ may be more suitable to carry on to transport modeling simulations. ~~(to be determined).~~
- The Regulators believe that together with these improvements the models ~~should~~ may satisfy the AOC objectives of bettering the understanding of the

groundwater system for this deliverable given the currently available data.

Short term model improvements

- While the Navy's work reflects a significant effort, uncertainty related to the current models significantly limits the Regulatory Agencies ability to utilize these models as-is to support risk management decisions. To do this, the models should be better able to fit agreed upon calibration targets and reproduce inferred local conditions, including a more detailed inclusion of heterogeneity.
- Though the ensemble of models depict a range of possibilities for conditions around the Facility, no single model represents the most likely combination of these features.- Parameters selected by the Navy vary significantly between models, ~~and are outside the bounds of other Oahu models~~, making it difficult to select and refine best fit models for risk decision making~~no single model represents the most likely combination of these features.~~.

Commented [LS4]: Disagree with this change. data can be used as a calibration target, but mo requires interpretation in order to derive field c

Commented [MT5R4]: This is a good point, w direct interpretation of the data themselves is p problematic at this time.

Commented [TL6]: I disagree with this insertio we are specifically referencing these other Oahu our letter or presentation AND agree that using models' parameters is acceptable. My revision is

Commented [GGF7R6]: Okay. I left your char used Matt's language for the parameterization b

•Parameterization: *parameter values must be with other sources of information.*

Commented [TL8]: Fenix, I removed the langu the term 'standard' here.

Commented [GDB9]: This is still totally unclea Navy used parameter ranges outside the bounds credible Oahu models, but without justification. leave it so vague as to not be useful.

- Per the recommendations from our SMEs, the Navy should modify and consolidate the models to reflect more plausible conditions based on lessons learned from the multi models and currently available data.

Specific Areas for Short Term Improvement

- Representation of geologic heterogeneity, as schematically depicted in the Navy's CSM, in the area of the facility based upon available information.
- Evaluation of vertical anisotropy within the different aquifer materials (clinker, massive, and fractured, basalts).
- Parameter values selected must be consistent with other local

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sources of information~~Justification of parameter and boundary values~~ to better reflect ~~as being more reflective of~~ underlying conditions.

Commented [TL10]: Unclear to me what 'just underlying conditions mean in this context. It do like justification of the Navy's choices is what we for as an improvement.

Commented [GGF11R10]: Used Matt's langu

- Layering – especially of basalts abutting saprolite – should be defined in the flow model similarly to how it is presented in the Navy's CSM.
    - Vertical refinement (layers) around the facility.
- Assessment of the sources of water produced in RHS, using model-based mixing analyses and geochemical data should be evaluated:
    - This should provide another line of evidence for understanding plausible flow ~~fields, and~~fields and help transition into CF&T modeling.

Overall Project Goals

- The Regulators would like to see only the most plausible flow - models carried forward to transport modeling and other related groundwater protection activities:
  - ~~Ultimately these improvements could lead to a better understanding of probable residence times, as well as attenuation rates in the CF&T modeling work.~~
- The Regulators would like to understand the Navy's vision for ongoing use and future updates of modeling to inform and protect the resource as new information is acquired beyond the deliverable timeline.

Commented [GGF12]: Lyndsey, if you'd like t perhaps we could edit to make it clear that only phase transport modeling can be be used to refi gwtm as it doesn't/cant address LNAPL.

Commented [GGF13]: Suggest dropping this i really refers to outcomes of a future CFT

- The Navy's preliminary hydrologic field testing in preparation for the tracer study design may also provide additional information to further refine the flow model reliability in the future.
- ~~The Navy's planned field testing in preparation for the tracer study design may also provide information to further refine the CSM and future numerical modeling efforts.~~

MATT'S PRESENTATION

Bob's chemistry mixing slides

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